GOKHSHTEYN, B.Ya., kand. tekhn. nauk; TAMAZOV, A.I., inzh.

Three-core transformer for a.c. traction substations. Vest. TSNII MPS 22 no.3:17-19 '63. (MIRA 16:7)

(Electric transformers)
(Electric railroads--Substations)

TAMARIN, Aleksandr [illegible]

[Nonsymmetry of stresses and velocities in the case of plane-phase traction loads] Nesimmetriia napriazhenii i skorostei v ploskoi vaemaia zadache s"emnogo davleniia. Moskva, 1965. 232 p.

L 14546-66 EWT(m)/EWP(v)/T/EWP(t)/EWP(k)/EWP(b) JD/HM

ACC NR: AP6005386 SOURCE CODE: UR/0413/66/000/001/0134/0134

INVENTOR: Sedykh, V. S.; Pashkov, P. O.; Kofman, A. P.; Gokhshteyn, B. Ye.; Pavlov, A. I.; Likhachev, G. F.

ORG: none

TITLE: A method of producing three-layer metal plates. Class 49, No. 177759

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 1, 1966, 134

TOPIC TAGS: metal plate, three layer plate, clad plate, plate cladding, explosive cladding

ABSTRACT: This Author Certificate introduces a method of producing three-layer metal plates by explosive welding. Explosive charges are placed on the outer surface of the plates to be welded. In order to increase productivity, both outer plates are welded to the center plate simultaneously by a charge detonated at one point. In order to improve the quality of the bond, a centering prism is set up on the upper edges of the plates so that one edge of the prism faces the detonator. Orig. art. has: 1 figure.

[WW]

SUB CODE: 11/ SUBM DATE: 23Mar64/ ATD PRESS: 4197

Cladding 18

GPC

Card 1/1 UDC: 621.791.044—419.5

GOKHSHTEYN, D., professor, doktor tekhnicheskikh nauk.

Working process theory of refrigerating plants. Khol.tekh. 30 no.4:58-62 O-D '53. (MLRA 7:3)
(Refrigeration and refrigerating machinery)

MARTYNOVSKIY, V., professor, doktor tekhnicheskikh nauk; GOKHSHTEYN, D., professor, doktor tekhnicheskikh nauk.

"Techincal thermodynamics." M.P.Vukalovich, I.I.Novikov. Reviewed by V.Martynovskii, D.Gokhshtein. Khol.tekh. 30 no.4:76-77 O-D '53. (Thermodynamics) (Vukalovich, M.P.) (Novikov, I.I.)

GERSHTEYN, D.KH.

GO SHTEYN, D.Kh.

Treatment of heart diseases in Kislovodsk. Sovet. med. 16 no.4:12-15 Apr 1952. (CLML 22:1)

1. Professor. 2. Koslovdsk. 3. Use of mineral springs baths.

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8

Halogen substituted hydrocarbons as a possible working agent in binary heat installations [illegible]

F

17

1659. REGENERATIVE STEAM POWER CYCLES. Gokhshtein, D.P. (Izvestiya Vsesoyuznogo Teplotekhnicheskogo Inst. (Bull. All Union Heat Engng Inst.), Dec. 1947, (12). 23-27). On the basis of an examination of the sources of degradation of energy, formulae are given for determining the efficiency of the regenerative cycle and comparisons are made between various theoretical schemes for making practical use of this cycle.

(L).

GUKHSHTEYN, L. P. Prof. Dr. Tech. Sci.

"Application of the Second Law of Thermodynamics to the Analysis and Computations of Central Heating," Vest. Inzhenerov i Tekhnikov, No.4, 1948.

Energetics Society

GOKHSHTEYN, D.P. doktor tekhnicheskikh nauk; LITVIN, A.M., redaktor; BABOCHKIN, S.N, tekhnicheskiy redaktor.

[Entropy method of calculating energy losses] Entropiinyi metod rashcheta energeticheskikh poter'. Moskva, Gos.energ.izd-vo, 1951. 109 p. (MLRA 8:11)
(Heat engineering)

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8

536.75

7219. **The role of the increase of entropy in the analysis of thermal processes.** D. P. GOLOSHTEIN. *Zh. Tekh. Fiz.*, 21, 1121–36 (*No.* 9, 1951) *In Russian.*

A method is developed of using the increase of entropy in an isolated system for analysing the completeness of thermal processes. It is shown that the degree of deviation of real processes from the ideal ones is more distinctly and objectively characterized by the ability of heat to do work and by the degradation of energy in an isolated system than by the idea of efficiency. The degradation of energy in an isolated system is strictly defined as the product of the increment of its entropy by the absolute temperature of the ambient medium. Owing to the additive nature of entropy, an equation characterizing the degree of perfection of the heat diagram and of the working process of a plant can be developed as a function of the sum of variables; this equation lends itself better to mathematical transformations than that of efficiency, which is a function of a product of variables.

F. LACHMAN

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8"

1. GOKHSHTEYN, D. P.

2. USSR (600)

4. Steam, superheated

7. On the problem of cycles of superheated steam, Energ. biul., No. 12, 1952.

9. Monthly List of Russian Accessions, Library of Congress, April, 1953, Uncl.

GOKHSHTEYN, David Petrovich, RASSKAZOV, D.S., redaktor; SKVORTSOV, I.M., tekhnicheskiy redaktor.

[Using waste heat in heat pumps] Ispol'zovanie otkhodov tepla v teplovykh nasosakh. Moskva, Gos. energ. izd-vo, 1955. 79 p.
(Heat pumps) (Waste heat) (MLRA 9:5)

AID P - 1329

Subject : USSR/Engineering

Card 1/1 Pub. 110-a - 11/19

Authors : Gokhshteyn, D. P., Doc. of Tech. Sci. and Gorbis, E. R., Kand. of Tech. Sci.

Title : The prospects of applying combined steam-gas installations to direct heating

Periodical : Teploenergetika, 2, 47-49, F 1955

Abstract : Schemes of heat and power stations (TETs) working on gas-steam and on steam are compared. A thermodynamic and economic analyses show that the gas-steam scheme has no substantial advantages over steam, when high and super-high parameters of steam are utilized. Diagrams.

Institution : Odessa Technological Institute

Submitted : No date

GOKHSTEYN, D., professor, doktor tekhnich. nauk

Concerning the article, "Degree of thermodynamic efficiency of [illegible] transfer and refrigerating equipment." Khol. tekh. 32 no. 3:65 May-Je 55.
(Thermodynamics) (MLRA 8:7)

GOKHSHTEYN, D P

21

1767. PROBLEMS of [illegible] ANALYSIS of COMBINED GAS AND STEAM CYCLES. Gokhshteyn, D.P. (Teploenergetika [Heat Power Engineering] (USSR)) No. 1, 1957, vol. 4, 42-45). The expediency is demonstrated, from a thermodynamic standpoint, of using combined gas and steam installations (i.e. upper stage of which is served by a gas turbine unit in closed circuit and the lower by an ordinary steam turbine unit.

2 cards.

MT

AUTHOR: Gokhshteyn, D.P.

TITLE: Atomic Energy Installations Thermic Cycle (O teplovom tsikle atomnykh energeticheskikh ustanovok)

PERIODICAL: Physics and Thermotechniques of Reactors (Fizika i teplotekhnika reaktorov), Supplement Nr 1 to Atomnaya energiya, 1958 (USSR)

ABSTRACT: The following conclusions may be drawn from general considerations:
1.) The thermodynamical analysis of the cooling cycle of an atomic electric power plant shows that it is advisable to use low boiling media as heat carriers (Freon, etc.).
2.) In dependence on the initial conditions and the thermal stability of the low boiling medium either only one or also two cooling cycles can be used. In the inner part of the second cycle it is possible to use a gas (CO_2, He, etc.). In some cases it may, however, also be of advantage to use such low boiling media as are used in the external cycle. In this case each cycle has its own heat transfer to the condenser.
There are 7 figures, 2 tables, and 4 references, 1 of which is Slavic.

AVAILABLE: Library of Congress

Card 1/1

1. Atomic power plants-Heat transfer 2. Reactors-Heat transfer

GOKHSHTEYN, D.P.

Thermal cycle of atomic power plants. Atom. energ. Supplement no.1: 198-204 '58. (MIRA 11:5)
(Atomic power plants) (Heat engineering)

96-58 [illegible]

AUTHOR: [illegible], D.P., Doctor of Technical Sciences

TITLE: Selection of the Optimum **Pressures for Periodic Reheating of Steam** (Vybor optimal'nykh davleniy [illegible])

PERIODICAL: Teploenergetika, 1958, [illegible] (USSR)

ABSTRACT: The [illegible] is frequently governed by operating conditions and boiler design features. The problem then arises of selecting the best reheat pressures. This is a short theoretical article on the subject. It is based on consideration of the temperature/entropy diagram for a steam turbine installation in which the process of expansion in the turbine takes place at constant entropy; the process of regenerative feedwater heating is reversible and is represented on the T-S diagram by a vertical line. Formulae are derived for the best reheat conditions and a procedure for making the calculations is recommended. There are 5 figures and 1 German reference.

ASSOCIATION: Chelyabinsk Technological Institute (Chelyabinskiy tekhnologicheskiy institut)

AVAILABLE: [illegible]

Card 1/1

1. Steam turbines-Pressures 2. Entropy

GOKHSHTEYN, D.P.

Quantitative characteristics of irreversible thermal processes.
Nauch. dokl. vys. shkoly; energ. no.2:153-155 '58. (MIRA 11:11)
(Thermodynamics)

GOKHSHTEYN, D. P. Odesskiy tekhnologicheskiy institut

"Problem of Increasing the Efficiency of Large Steam Power Stations Operating with Steam of Super-critical Parameters."

The Commission for High-paramter Steam of the Energeticheskiy institut (Power Institute) imeni G. M. Krzhizhanovskogo AN SSSR held a conference on May 16, 1958 devoted to new types of equipment for block-assembled power stations, operating at super-critical steam parameters. This paper was read at this conference.

Izv. Akad Nauk SSSR, Otdel Tekh nauk, 1958, No. 7, p. 152

Card 1/6

The Problem of Expanding Existing Power Plants

650°C. The efficiency of such a system, working on natural gas (8533 Cal) with an initial gas temperature of 700°C, is 38.3% with the VK-100-2 turbine and 34.8% with the AK-50 turbine. The authors compared the various possible superimposing and extension systems. This comparison is shown in table 1. The authors arrive at the following conclusions: 1) From the thermodynamic viewpoint, only such a gas turbine extension will be more effective at which the internal regeneration of the gas cycle is highly developed. 2) In a number of cases, a gas turbine extension will be more profitable than steam superimposing of existing power plants, provided liquid or gaseous fuel is available. This peculiarity is especially obvious when superimposing power plants with initial steam parameters of 90 atmospheres and 480°C. 3) The lower the parameters of the steam section of the existing power plant, the relatively higher the superimposing of such power plants will be. The efficiency of superimposed power plants having lower steam parameters will exceed in

GOKHSHTEYN, D.P., doktor tekhn.nauk, prof.; KRASOTOV, A.I., kand.tekhn.nauk, dotsent

Aspects of regenerative feed-water heating in units with intermediate superheating. Energomashinostroenie 4 no.4:26-31 Ap '58. (MIRA 11:7)

(Steam turbines)

GOKHSHTEYN, D.P., doktor tekhn.nauk

"Outlook for the development of steam and gas turbines for electric power plants" by S.A.Aksiutin. Reviewed by D.P. Gokhshtein. Elek.sta. 29 no.11:94-95 N '58. (MIRA 11:12)
(Turbines) (Aksiutin, S.A.)

SOV/96-59-5-6/19

AUTHORS: Gokhshteyn, D.P., Doctor of Technical Sciences and Verkhivker, G.P., Engineer

TITLE: Some Methods of Reconstructing Steam Turbine Electric Power Stations Using Steam-Gas Circuits (Nekotoryye puti rekonstruktsii paroturbinnykh elektrostantsiy po parogazovym skhemam)

PERIODICAL: Teploenergetika, 1959, Nr 5, pp 33-37 (USSR)

ABSTRACT: As a number of steam-driven power stations become converted to natural gas fuel, it will be possible to make extensive use of open-cycle gas-turbine installations. A combined gas-steam cycle offers thermo-dynamic advantages. If the heat of the gas-turbine exhaust is used to heat feed-water for the steam cycle, the amount of steam tapped from the turbines for this purpose is reduced and the output for a given steam consumption can be increased by 20%. A combined gas-steam installation can quite easily be introduced into existing stations with quite small cost for equipment and structural alterations. The simplest steam-gas circuit for reconstructing existing installations with 100-MW condensing turbines type VK-100-2

Some Methods of Reconstructing Steam Turbine Electric Power Stations Using Steam-Gas Circuits

is given in Fig 1. In this the turbine exhaust gases are used first to heat the air entering the combustion chamber and then to heat the feed-water of the steam cycle. Table 1 gives the results of calculations of the effective efficiency and output of a steam-gas installation using the circuit of Fig 1 for various feed-water temperatures. It is shown that the efficiency of the steam-gas installation is increased by raising the feed-water temperature after the water-gas heater. The increase in efficiency is quite marked up to a feed-water temperature of 220°C but beyond this it does not increase so rapidly. The circuit shown in Fig 2 considerably reduces the power taken from the gas turbine part of the installation. Here the feed-water draws heat both from the turbine exhaust gas that has already passed through an air regenerater and from the air between the high and the low-pressure compressors. In this case the highest efficiency is obtained if the feed-water is heated to a temperature of 101.3°C in the water gas heat exchanger with subsequent

Some Methods of Reconstructing Steam Turbine Electric Power Stations Using Steam-Gas Circuits

heating to 220°C in the regenerative heaters of the turbine. With this circuit the increase in efficiency is less than with circuit 1 because the output of the gas turbine part of the installation is less. The results of calculations on circuit 2 are given in Table 2 and it is shown that in this case quite a small gas-turbine offers an appreciable increase in efficiency as compared with a straight steam cycle. A circuit with two stage fuel consumption is shown in Fig 3 and the results of calculations on this circuit are given in Table 3. It is of interest to note the efficiencies with two stage compression and two-stage expansion of gas in the gas turbine installation: they fall into a pattern similar to that observed with single stage compression and single-stage expansion. A schematic circuit for two stage expansion and two-stage fuel combustion with single-stage compression is shown in Fig 4. It increases the efficiency of the steam-gas installation to 36.7% which is 13% higher

Some Methods of Reconstructing Steam Turbine Electric Power Stations Using Steam-Gas Circuits

than for the purely steam cycle. The total output of the steam-gas installation is 130000 kW and the feed-water temperature after the steam-gas heater is 220°C. The improved performance of this circuit as compared with that shown in Fig 1 results from the greatly increased output of the gas-turbine part. An important disadvantage of the circuits mentioned is that the gas air regenerators and water-gas heaters are very big. In order to increase the unit output of the gas turbine and to reduce the size of the regenerators and water heaters there is some point in using the semi-closed steam-gas-turbine cycle illustrated in Fig 5. Here the main gas-turbine operates against a back pressure, the exhaust gases pass through an air regenerator and water heater before delivery to the inlet part of the compressor. The part of the gas needed to supply air to burn the fuel in the combustion chamber of the main turbine passes into the combustion chamber of the auxiliary turbine. The chamber also receives air from the first stage of the auxiliary compressor and fuel. The gas temperature at the chamber

Some Methods of Reconstructing Steam Turbine Electric Power Stations Using Steam-Gas Circuits

outlet is 700°C as it is after the combustion chamber of the main turbine. The exhaust gases from the auxiliary turbine are passed to a regenerator where they heat up the air and gas supply to the combustion chamber and are then discharged to atmosphere. The auxiliary turbine drives the two stage compressor which delivers combustion air to the main system. With this arrangement the size of the different heat-exchangers can be much reduced. Semi closed steam-gas cycles are better than closed ones for modernising existing power stations because there is no need to instal an air boiler also the heating surfaces are smaller and the circuit is simpler and more efficient. Results of efficiency calculations for the circuit are given in Table 4. It is possible to use a circuit in which part of the turbine exhaust gas is used as air to maintain combustion in the boiler furnaces. This circuit shown schematically in Fig 6, embodies the semi closed part operating on the circuit already described but without

SOV/96-59-5-6/19

Some Methods of Reconstructing Steam Turbine Electric Power Stations Using Steam-Gas Circuits

which burn blast furnace or coke oven gas as well as solid fuel. For comparison the calculations were made on a closed steam-gas cycle with single-stage compression and two-stage heating operating under the same conditions as the steam-gas semi-open cycle. The effective efficiency of this installation is 34.7% and the increase in effective efficiency of the closed steam-gas cycle compared with the straight steam cycle is 8.05%. As the ordinary gas-turbine installations developed by Soviet factories are not the best ones for steam-gas circuits, there is a need for special versions suited to operation in combined installations. There are 6 figures, 4 tables and 3 references, 2 of which are Soviet and 1 English.

ASSOCIATION: Odesskiy Tekhnologicheskiy Institut (The Odessa Technological Institute)

SOV/96-59-8-

AUTHOR: Gokhshteyn, D.P., Doctor of Technical Sciences

TITLE: The Influence of Reheat on the Fuel Consumption in a Heat and Electric Power Station

PERIODICAL: Teploenergetika 1959, Nr 8, pp 62-63 (USSR)

ABSTRACT: A number of investigations have shown that the use of reheat in a heat and electric power (or district heating) station results in considerably less fuel economy than it does in condensing stations and even leads to an increase in fuel consumption. In condensing sets with regenerative heating the use of reheat reduces the irreversibility of heat transfer from the combustion products to the working substance but increases the irreversibility of heat exchange between the heating steam bled from the turbine and the regeneratively heated feed water. In a district heating station with multi-stage pass-out heating the system water the steam is usually tapped from the same places as that used for regenerative heating of the feed water. Therefore intermediate reheat in a district heating station increases the irreversibility of heat exchange, i.e. omits

Card 1/4

The Influence of Reheat [illegible] Addition of a Heat at [illegible] Electric Power Station

[illegible] the magnitude of this effect. The principal [illegible] made [illegible] for the [illegible] are [illegible] particular [illegible] as shown in Fig. [illegible] and [illegible] station [illegible] created [illegible] with [illegible] [illegible] with [illegible] assumption [illegible] 400 [illegible] [illegible] of Fig. [illegible] to reheat [illegible] in that of Fig. [illegible]. The [illegible] and other [illegible] assumptions [illegible] the data required in the calculations are given [illegible] Figures. The results of the calculations are tabulated [illegible] show that the circuit with reheat gives [illegible] assumption that this without reheat. The [illegible] already seen from the table reheat reduces the [illegible] losses during heat exchange in the boiler by [illegible] increases the ranges of heat exchange in the high-[illegible] heaters by [illegible] and in the system heaters by [illegible]. In addition, because of the corresponding increase in the heat drop in the turbine for the same fuel consumption, the power loss in the turbine increased by [illegible] and in the condenser by [illegible]. A further [illegible] [illegible] of the

Card 2/4

SOV/96-59-8-17/

The Influence of Reheat on the Fuel Consumption of a Heat and Electric Power Station

increase in losses in the condenser is that when reheat is used the steam entering the condenser is drier and so its entropy is greater. The losses in the system heaters are greater than in the regenerative heaters because the t.d. heat transfer is much greater. The most effective way of improving the situation is to reduce the superheat of the heating steam at the inlet to the water heaters so that the mean temperature difference of heat exchange in these heaters is reduced. Fig. 5 shows a steam circuit diagram designed with this object in mind. Steam taken from the first two tappings after the gas superheater is cooled in a regenerative superheater and in water heaters. It is then used partly in the system heaters and partly in the regenerative heaters. Data for this circuit are also tabulated and it will be seen that the energy loss during heat exchange in the boiler is reduced by 0.13%. The further reduction in the reheat of the heating steam improves the losses in the regenerative heaters by 0.4% and in the system water heaters by 0.1%. The quantity of

Card 3/4

SOV/96-59-8-17/27

The Influence of Reheat on the Fuel Consumption of a Heat and Electric Power Station

[illegible]

ASSOCIATION: [illegible] Teploenergeticheskiy Institut (Odessa Teplotekhnicheskiy Institut)

Card 4/4

GOKHSHTEYN, David Petrovich; VERKHIVKER, Grigoriy Petrovich; KURITS, S.Ya., red.; SHIKIN, S.T., tekhn.red.; LARIONOV, G.Ye., tekhn.red.

[Problem of increasing the efficiency of steam power plants] Problema povysheniia K.P.D. paroturbinnykh elektrostantsii. Moskva, Gos.energ.izd-vo, 1960. 206 p. (MIRA 13:11)
(Steam power plants)

AUTHOR: Gokhshteyn, D. P., Doctor of Technical Sciences

TITLE: A Conference on the Introduction of Gas Turbines and the Steam/Gas Cycle Into the Power Engineering System of the Ukraine

PERIODICAL: Teploenergetika, 1960, Nr 2, pp 90-92 (USSR)

ABSTRACT: On the 21 to 24 September, 1959, a conference was held in Odessa on the introduction into the Ukraine of gas turbines and the steam/gas cycle. It was called by the Scientific Technical Commission of the Council of Ministers of the Ukrainian SSR and the Odessa District Directorate of the Scientific-Technical Society of the Power Industry. The Conference was attended by more than 130 representatives of turbine and boiler works, design organisations, power systems, and institutes. A report by Candidate of Technical Sciences G. B. Yakushi of Gosplan UkrSSR noted that the expansion of the Ukrainian Power system in the near future would result mainly from extension of existing stations, with the use of gas turbines of 25 and 50 MW. Acad. I. T. Shvets reviewed scientific research work on gas turbines.

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8"

A Conference on the Introduction of gas Turbines and the Steam/Gas Cycle Into the Power Engineering System of the Ukraine

gas-turbine cycle, with preliminary cooling of the working substance. Candidate of Technical Sciences K. V. Olesevich of the Odessa Polytechnical Institute considered the development of gas turbines working on solid fuel. Corresponding Member of the Academy of Sciences Ukr.SSR A. D. Kovalenko described an investigation at the Institute of Structural Mechanics of the Academy of Sciences UkrSSR on the strength of gas turbines. Corresponding Member Academy of Sciences UkrSSR G. S. Pisarenko reported the work of the Metallo-ceramic Institute of the Academy of Sciences UkrSSR on the development of metallo-ceramic heat-resistant materials for gas turbine blades. V. S. Martynovskiy (Dr. of Tech. Sc.) of the Refrigeration Institute described tests on eddy tubes by which it is possible to approximate to adiabatic temperature-drops. Candidate of Technical Sciences Yu. M. Didusenko reported on the work of the Laboratory of Hydraulic Machines of the Academy of Sciences UkrSSR to determine the optimum conditions of gas-turbine

A Conference on the Introduction of Gas Turbines and the Steam/Gas Cycle Into the Power Engineering System of the Ukraine

installations with regeneration of the exhaust-gas heat. Candidate of Technical Sciences M. I. Korneyev described the work of the Central Boiler Turbine Institute in developing high efficiency steam/gas cycles with high-head steam generators. Further reports were read by Engineer L. N. Kudryashev, Doctor of Technical Sciences A. I. Andryushchenko and Engineer V. N. Lapshov of the Saratov Highway Institute, Candidate of Technical Sciences, S. R. Gorbis, Engineer V. M. Yankelevich, Acad. I. T. Shvets and Candidate of Technical Sciences Ye. P. Dyban described the results of an investigation of the temperature field of the rotor and casing of a gas turbine, using analogue methods. Further reports were given by Engineer D. M. Vaksman, Engineer T. S. Vishnevskiy, Engineer A. P. Svichar, Engineer G. P. Verkhivker, Engineer R. Ye. Fechenkov, Engineer A. D. Yaremenko, Engineer G.Ye. Muratov, and Engineer V. S. Dubchak. The Conference made recommendations for further work on the introduction of gas turbines into the Ukraine.

96092
S/096/60/000/012/005/008
E194/E484

26.3160
26.3200

AUTHOR: Gokhshteyn, D.P., Doctor of Technical Sciences

TITLE: On the Problem of Raising the Efficiency and Output of Gas Turbines

PERIODICAL: Teploenergetika, 1960, No 12, pp 33-38

TEXT: An unfortunate feature of the gas turbine cycle is that unlike the steam turbine cycle extraction of heat from the gas necessarily occurs at a varying temperature so that transfer of heat to the surrounding medium is accompanied by a large power loss. The problem of using the exhaust heat of internal combustion engines and gas turbines for power generation has not yet been satisfactorily solved, partly because of the low thermodynamic efficiency of the process and partly because of the expense of constructing the large surface heat exchangers. The mean temperature difference of heat exchange between the exhaust gases and the steam that they heat may be reduced by using supercritical steam conditions in the heat exchanger, but with existing gas turbine exhaust temperatures this is clearly impossible. Accordingly, the use of low boiling point substances such as freon.

3/096/60/000/012/005/008
E194/E484

On the Problem of Raising the Efficiency and Output of Gas Turbines

or sulphur hexafluoride, which have a low critical pressure should be considered for use in the heat exchangers. Accordingly calculations were made for a number of binary cycles of which the upper stage is a gas turbine type GT-100-750 (GT-100-750) and the lower stage is an installation working on Freon 12. The binary cycle diagram is given in Fig.2 and a block diagram of the arrangement of the equipment is given in Fig 3. The efficiency of the gas turbine alone is 38% and that of the binary set under the conditions given 43.9%. Comparative data for the gas turbine alone and for the binary set are tabulated. The inclusion of the Freon stage reduces the power loss by heat exchange to the surrounding medium by 9.36% whilst the loss due to heat exchange with the Freon is increased by 1.91%. Previous articles have considered the idea of developing a cycle having all the heat regeneration features characteristic of the gas turbine cycle but with condensation of the working substance as the heat is extracted from it. In this case the working substance must, of course

"6082

S/096/60/000/012/005/008
E194/E484

On the Problem of Raising the Efficiency and Output of Gas Turbines

have a low boiling point and carbon dioxide has been considered
A carbon dioxide cycle which has been recommended hitherto is
shown in Fig.4. Cycle characteristics are assumed and
efficiencies are worked out and the heat balance characteristics
of the carbon dioxide set are tabulated It is concluded that the
power losses due to irreversibility of heat exchange in the
regenerator for the carbon dioxide set are eight times greater than
the corresponding losses for the gas freon set. The losses in the
carbon dioxide heat exchanger are 1.13 times greater than those in
the combustion chamber of the gas-freon set. Curves of heat
exchange in the regenerator of the carbon dioxide set are plotted in
Fig.5 and are discussed. The possibility of increasing the degree
of regeneration in cycles with low boiling substances by using
combined heat regeneration is discussed and a corresponding carbon
dioxide cycle is shown in Fig.6 A block diagram of the
corresponding plant layout is shown in Fig.7 Comparison of energy
balances shows that the combined regeneration of heat used in the

Card 3/5

S/096/60/000/013/007/008
E194/E484

On the Problem of Raising the Efficiency and Output of Gas Turbines

circuit of Fig.6 reduces the power losses due to irreversible regenerative heat exchange by a factor of almost 3.5 as compared with the usual regenerative cycle of Fig.4. This is the main reason for the corresponding fuel economy of 23%. With a simple circuit a carbon dioxide installation may have high unit powers of the order of 500 MW per exhaust. The high efficiency of the installation makes it particularly suitable for regions with solid fuels. In conclusion the case is considered of using the exhaust gas heat of a gas turbine to heat the feed water of a steam installation with supercritical initial steam conditions. Fig.8 shows a block diagram of the equipment for such an installation which combines the gas turbine set type GT-100-750 with a steam set type [illegible]-300 (SKK-300). The main difference between the circuit of Fig.8 and the usual circuits with high pressure steam generator consists in the use of steam at super-critical initial conditions. Curves of heat exchange between gas and steam in this circuit are plotted in Fig.9. It is shown that the use of this cycle increases the output of the steam-gas installation from 300 to 430 MW. It is concluded that the use of combined heat

S/096/60/000/012/005/008
E194/E484

On the Problem of Raising the Efficiency and Output of Gas Turbines

regeneration in carbon dioxide power sets makes them very promising for medium and large outputs the possibility of obtaining some hundreds of megawatts per exhaust makes them particularly attractive. There are 9 figures 1 table and 8 references 6 Soviet, 1 Czech and 1 German

ASSOCIATION Odesskiy tekhnologicheskiy institut
(Odessa Technological Institute)

Card 5/5

S/095/62/000/003/005/008
A104/A455

AUTHOR: [illegible], Doctor of Technical Sciences, Professor

TITLE: A thermo-dynamic analysis of the thermal circuit of a magnetohydrodynamic generator

PERIODICAL: Izvestiya Akademii Nauk SSSR, Energetika i Transport, no.3, 1962, 51-60

TEXT: As a recent American proposal for a magnetohydrodynamic generator (Ref.1: "Power", v.103, no.11, 1959, 64-65; Ref.2: "Engineering", I, 1960, 118) thermally-ionized combustion products pass through a magnetic field so that an electric field is set up in the combustion products. Interaction between the magnetic and electric fields retards the gas flow and electrons pass to the electrodes. This article gives a thermo-dynamic analysis of the circuit described in Ref.1,2 and compares it with steam/gas cycles. In the published work there seems to be some error in the temperatures of the combustion products and compressed air before and after the regenerator and, accordingly, the temperatures are recalculated. The steam turbine part of the circuit was taken to be a ЛМЗ(LMZ) type K-300-240 turbine without the regenerators.

Card 1/4

A thermo-dynamic analysis ...

The combustion products are assumed to have the properties of air and the weight of the fuel is ignored. A temperature/entropy diagram of the cycle is given. Thermodynamically the cycle is equivalent to an ordinary steam cycle in which part of the heat of the exhaust gas is used for regenerative heating of compressed air and part is used to produce steam, whilst a small part is transmitted direct to the surrounding medium. Energy balances of two magnetohydrodynamic generators are worked out and tabulated. The magnetothermodynamic generator is compared with a steam turbine type K-300-300 which uses a stop-valve temperature of 650°C with two reheats to 565°C, and has an electrical efficiency of about 44%, i.e. about 11% lower than the expected efficiency of the magnetohydrodynamic generator. The difference in efficiency is due to the difference in energy losses. In the American cycle, the initial temperature is very high but its main disadvantage is that the steam loss is high so that not all the advantages of the high initial temperature are used. This is confirmed by considering the simpler steam/gas circuit of OTM-1030 (OTI-Yuza) (Ref.9: D.P.Gokhshteyn, G.P.Verkhivker. Problems of

Card 3/4

A thermo-dynamic analysis ...

raising the efficiency of steam turbine power stations. Gosenergoizdat, 1960), which is briefly described here. The initial temperature is 1208°C and the total efficiency is 0.53, although these are not the optimum conditions for the CTI-Yuza circuit. The reason why the CTI-Yuza circuit with a maximum cycle temperature of 1208°C has an efficiency approaching that of the magnetohydrodynamic generator with a maximum temperature of 3100°C is explained by comparing the energy balances of the two cycles. One of the difficult problems in making a magneto-hydrodynamic generator is that of ensuring high-temperature regenerative heating of compressed air. It would be difficult to do this in regenerative heat exchangers and it is considered that it will be simpler to construct regenerators using a flowing solid heat-transfer medium such as sand. A circuit of this kind is described and analysed and it is shown that the efficiency can be increased by raising the temperature at the end of the regenerative heating of the compressed air to 2200°C. Such a temperature could not be reached with a regenerative heat exchanger. The use of such high temperatures might delay the development of

A thermo-dynamic analysis ...

The [illegible] thermodynamic generator but the prospects of designing an equivalent without metallic heat-exchange surfaces, with a considerable gain in efficiency is very attractive. There are 5 figures, 4 tables and 9 references: 5 Soviet-bloc and 4 non-Soviet-bloc. The four references to English language publications read as follows: Ref.1, Ref.2 - as quoted in text; Ref.7: Transaction of ASME, no.6, 1950, 781; Ref.8: "NBS Circular", 1955, 564.

ASSOCIATION: Odesskiy tekhnologicheskiy institut
(Odessa Technological Institute)

GOKHSHTEYN, D.P., doktor tekhn.nauk, prof.

Efficient diagram of a trubine installation for the electric power system of a district heating plant. Energomashinostroenie 8 no.2:12-14 F '62. (MIRA 15.2)
(Heating from central stations) (Steam turbines)

GOKHSHTEYN, D.P., doktor tekhn.nauk

Some means for creating large highly efficient thermal power systems. Elek. sta. 33 no.4:4-10 Ap '62. (MIRA 15:7)
(Electric power plants)

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8"

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8"

[illegible]

[Will the [illegible] accept A popular exposition of the theory of entropy] but what is Einstein's theory? Popularizations of Einstein's relativity theory, Gravitation [illegible] (Einstein's Unplotted Tale, no.11)

(N.Y.A Herald)

(Entropy)

GOKHSHTEYN, David Petrovich; [illegible], S.S., red.; FRIDKIN, L.M., tekhn. red.

[Entropy method for calculating energy losses] Entropiinyi metod rascheta energeticheskikh poter'. Izd.2., perer. Moskva, Gosenergoizdat, 1963. 109 p. (MIRA 16:6)
(Heat engineering) (Thermodynamics)
(Refrigeration and refrigerating machinery)

L 31542-65 S/0114/64/000/011/0020/0022

ACCESSION NR: AP5009157

AUTHOR: Gokhshteyn, D. P. (Doctor of technical sciences); Dekhtyarev, V. L. (Candidate of technical sciences); Tishchenko, B. S. (Engineer); Olesevich, Yu. K. (Engineer); Khalaydzhi, V. N. (Engineer); Ryabova, A. S. (Engineer); Brkov, V. N. (Engineer); Kozorez, A. I. (Engineer)

TITLE: Medium power carbon dioxide power installation

SOURCE: Energomashinostroyeniye, no.11, 1964, 20-22

TOPIC TAGS: electric power plant, carbon dioxide, electric power source

ABSTRACT: Theoretical principles for carbon dioxide power installations worked out at the Odessa Technological Institute imeni M. V. Lomonosov have shown the possibility for building high power compact units which are more economical than steam and gas turbines. Results of research on an installation of this type with a power of 50 Mw, the UKSU-50, show that the efficiency advantage of the carbon dioxide installation over steam units increases with a transition from high to medium power.

Card 1/3

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8

L 33542-65

ACCESSION NR: AP5009157

Following is the efficiency of the installation and its elements:

Generator power of the installation N, Mw	50.0
Consumption of carbon dioxide G, kg/sec	269.0
Efficiency, %:	
of the compressor, n_c	0.88
of the pump, n_p	0.80
of the turbines, n_t	0.90
of the boiler, n_b	0.92
of the generator, n_g	0.985
mechanical, n_m	0.99
of the thermal flow, n_{tf}	0.99
of internal requirements, n_{ir}	0.97
electrical efficiency of the engine room, n_e	44.1
net, n_{net}	39.0

Card 2/3

L 33542-65

ACCESSION NR: AP5009157

In spite of the low starting temperature of 565°, the 30% efficiency of the carbon dioxide installation exceeds that of gas turbine units with a starting temperature of 675° and higher. Orig. art. has: 1 table, 3 figures.

ASSOCIATION: none

SUBMITTED: 00	ENCL: 00	SUB CODE: EM	
NO REF SOV: 008	OTHER: 000	JPRS	

Card 3/3

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8"

GORBUNOV, P.F., doktor tekhn. nauk; [illegible], Ya., inzh.

Carbonic acid power system. Energ. stroi. no.11:73 [illegible]

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8"

L 33022-66 EWT(l)/EWT(m)/EWP(j) RM/JW/RM

ACC NR: AP6014394 (N) SOURCE CODE: UR/0096/66/000/001/0020/0024

AUTHOR: Gokhshteyn, D. P. (Doctor of technical sciences, Professor); Smirov, G. F. (Engineer); Kirov, V. S. (Engineer)

ORG: Odessa Technological Institute (Odesskiy tekhnologicheskiy institut)

TITLE: Characteristics of steam-gas systems with non-aqueous vapors

SOURCE: Teploenergetika, no. 1, 1966, 20-24

TOPIC TAGS: steam power plant, thermodynamic analysis, carbon dioxide

ABSTRACT: The article considers the question of the thermodynamic characteristics of low-boiling substances in steam-gas plants. The main characteristics are the following: there is no limit to raising the upper temperature of the working body, which makes it possible to attain high efficiency; intermediate heating is eliminated; it is possible to attain a power of the order of 1 million kilowatts at each discharge of a gas turbine, due to the higher density of the working body compared with water vapor; and, condensation takes place at the residual pressure. The article gives flow sheets of systems employing carbon dioxide as the working body, and two tables give experimental data obtained in such

Card 1/2 UDC: 621.165+621.438.001.13

L 33[illegible]

ACC NR: AP6014394

/

[illegible] systems. Conclusions are as follows: 1) use of low-boiling substances in the vapor cycle of a steam-gas plant lowers the specific fuel consumption by from 3-10% compared to a high pressure turbine system and by 12-21% compared to a steam power plant operating at the same temperature; 2) the efficiency of the application of low-boiling substances increases on going to higher initial temperatures; 3) among the substances investigated, C_4F_8 gave the highest efficiency. This means that the most advantageous thermochemical substance should be sought in the range of critical temperatures from 100-150°C. Orig. art. has: 6 figures and 2 tables.

SUB CODE: 10/ SUBM DATE: none/ ORIG REF: 010

Card 2/2

ACC NR: AP6021427 SOURCE CODE: UR/0413/66/000/011/0025/0025

INVENTORS: Gokhshteyn, D. P.; Kirov, V. S.

ORG: none

TITLE: Working method of a closed steam turbine system using low boiling matter. Class 14, No. 182179

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 11, 1966, 25

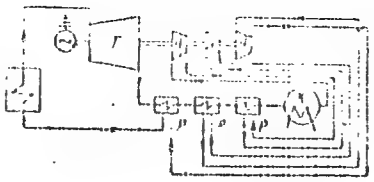
TOPIC TAGS: steam turbine, carbonic acid, steam condenser, heat source, [illegible] efficiency, [illegible]

ABSTRACT: This Author Certificate presents a working method of a closed steam turbine system using low boiling matter, such as carbonic acid, and regenerating the heat in several heaters. The system contains a turbine, a condenser, and pumps for carrying the working medium in its liquid state (see Fig. 1). To increase its efficiency and to lower the temperature at the entrance to the condenser, the working medium, after being condensed, is compressed in stages to its initial pressure by several pumps. After each pump, it is heated in the regenerating heaters.

Card 1/2 UDC: 621.438-176.2

ACC NR: AP6021427

Fig. 1. P - regenerating heaters; T - turbine; K - condenser; H - pumps



Orig. art. has: 1 figure.

SUB CODE: 21, 13/ SUBM DATE: 18Jan65

Card 2/2

64

9

The influence of heat treatment on the structure and mechanical properties of the tin-containing brasses "LM-62" V. O. Gogoi [illegible] and M. B. Bekhshtein. *Metallurg* 13, No. [illegible], 1939. [illegible] Alloys with 61–62% Cu and 1–2% Sn were subjected to heat treatment to [illegible] and such properties. Quenching [illegible] ably good results, this treatment prevents [illegible] of the brittle γ phase in the [illegible] quent annealing at 400° showed that [illegible] change in structure, the γ phase [illegible] the α phase with [illegible] of the excess [illegible] of the γ phase but with the original [illegible] being retained. The annealing at [illegible] such properties but the [illegible] pearance.

M. [illegible]

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R005156610005-8

"Relations Between Temperature Distribution and Zonal Development of Dendritic Crystals in Aluminium Castings. V. O. Grigor'ev and M. B. Goikhshtein; *Metallurg*, 1940, **15**, (10), 11–17; *Chem. Zentr.*, 1941, **112**, II, 2486, (C. Ba., 1941, **38**, 1717). [In Russian.] A study of aluminium castings showed that the growth of dendritic crystals in solidifying metal ingots can take place without temperature change in the liquid metal. The moment of interruption in the growth is not directly dependent on the time of temperature equalization in the remaining liquid, nor does it depend on the formation of gaps between the mould and the ingot.

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8"

GOKHSHTEYN, M.V., kand.tekh.nauk.

Effect of overheating the melt on the crystallization of aluminum and its alloys. TSvet.met.27 no.3:42-50 My-Je '54. (MIRA 10:10)

1. Vsesoyuznyy alyuminiyevo-magniyevyy institut.
(Aluminum--Metallography) (Crystallization)

ALEKSEYEV, N.S.; BELYAYEV, A.P.; BUGAREV, L.A.; BUTOMO, D.G.; VASIL'YEV, Z.V.; VERIGIN, V.N.; VOROB'YEV, G.M.; GAYLIT, A.A.; GOL'SHTEYN, P.M.; GOKHSHTEYN, M.B.; ZHOLOBOV, V.V.; ZEDIN, N.N.; IVANOV-SKOBLIKOV, E.I.; KUTEPOV, Ya.V.; LANDIKHOV, A.D.; MARAYEV, S.Ye.; MILLER, L.Ye.; OL'KHOV, N.P.; PERLIN, I.L.; POSTNIKOV, N.N.; ROZOV, M.N.; CHERNYAK, S.N.; CHUPRAKOV, V.Ya.; TSENTER, Ya.A.

Vladimir Oskarovich Gagen-Torn; obituary. TSvet.met. 27 no.5:67-68 S-O '54. (MIRA 10:10)

(Gagen-Torn, Vladimir Oskarovich, 1898-1954)

SOV/1:7-5 - -16742

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 9, p [illegible] (USSR)

AUTHORS: Belyayev, A.P., Gokhshteyn, M.B., Tsentser, Y.A.

TITLE: Improvements in the Procedure for Cleaning Raw Al [illegible] and for Processing it to Commercial Semimanufactures at Aluminum Plants (Usovershenstvovaniye tekhnologii ochistki alyuminiya-syrtsa i pererabotki yego na tovarnyye polufabrikaty na alyuminiyevykh zavodakh)

PERIODICAL: V sb.: Legkiye metally, Nr 4, Leningrad, 1957, pp [illegible]

ABSTRACT: A review is presented of measures carried out in the USSR and introduced into production to improve the procedures for cleaning raw Al and for casting it into ingots. It is noted that raw Al is now cleaned by chlorination in the ladle for [illegible] minutes, ~0.5 kg Cl_2/t Al being used, followed by settling for up to 1.5 hour in ladles or mixers. Semicontinuous casting of Al has been introduced. Ideas are presented on the further improvement of raw Al refining and casting procedures and on the advisability of organizing the production of Al alloys at [illegible] aluminum plants. [illegible]

Card 1/1 3. Aluminum--[illegible] 4. Aluminum--[illegible]

Y.Z.

AUTHOR: Belyaev A.P., and Gokshteyn, M.B., Candidates of Technical Sciences.

136-5-4/14

TITLE: Improvement in the quality of aluminium over the 25-years existence of the aluminium industry. (Uluchshenie kachestva alyuminiya za 25 let sushchestvovaniya alyuminevoy promyshlennosti.)

PERIODICAL: "Tsvetnye Metally" (Non-ferrous Metals) 1957, No. 5, pp. 24 - 29 (U.S.S.R.)

ABSTRACT: After brief notes on the improvements which have occurred in the last 25 years in the production technology of aluminium, the purity of the product is considered in more detail. From the original manual methods for the removal from the electrolyzer of metal, the industry has by now passed to the use of vacuum-ladles. Refining from non-metallic impurities is carried out by chlorination, electrolytic refining producing the following grades: AB0 - 99.93%; AB00 - 99.97%; AB000 - 99.99% and AB0000 - 99.996%. Metal is now cast on to casting machines sometimes first passing through the mixer. Mixers are used for casting ingots for wire, a semi-continuous method being used which has appreciably reduced production costs. For wire, ingots of type A0 and A1 are used according to ГОСТ 4004 - 53. The production of high-purity aluminium has always

Card 1/2

Improvement in the quality of aluminium over the 35-years existence of the aluminium industry. (Conc.) 136-5-4/14

been a characteristic of the industry and this is embodied in the latest standard specification (GOST 3549 - 55) which, unlike the international standard includes four types of aluminium with a purity exceeding 99.8% Al (already mentioned). The new standard includes a specification Si:Fe≤1 for semi-continuous and continuous casting. The new standard specification also requires the oxide and gas contents of pig aluminium to be determined. Determinations by the All-Union Aluminium-magnesium Institute and by works staff have shown that gas contents are in fact insignificant (0.05 - 0.25 cm^3/100 g for types A00, A0, A1 and A2 and 0.35 cm^3/100 g for AB000 type aluminium). In 1956 analyses were carried out by the Institute of most types of Soviet aluminium for accompanying impurities, and the results are tabulated in the present article. Although a high quality has been attained further improvements in quality, leading ultimately to the production of 99.9999-% Al is recommended, together with increased mechanisation and automation of production processes.

Card 2/2

There are 4 Slavic references.

ASSOCIATION: All-Union Aluminium-magnesium Institute. (VAMI)

AVAILABLE:

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8"

GOKHSHTEYN, M.B.

Quality of primary aluminum. Alium. splavy no.1:73-79 '63.
(MIRA 16:11)

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8"

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8

L 53966-65 EEO-2/EWT(m)/EWP(w)/EPF(c)/EPR(n)-2/EWA(d)/EPR/T/EWP(t)/EWP(b)/EIL-2
Ps-4/Pu-4 IJP(c) JD/WW/JG/WB

ACCESSION NR: AP5013604 UR/0136/65/000/005/0082/0085
669.71:621.315.55

AUTHOR: Krupotkin, Ya. M.; Gokhshteyn, M.B.

TITLE: Effect of niobium, beryllium, and cerium on the mechanical properties and electrical conductivity of aluminum

SOURCE: Tsvetnyye metally, no. 5, 1965, 82-85

TOPIC TAGS: aluminum conductor, electrical transmission line, aldrey, niobium additive, beryllium additive, cerium additive, graphite crucible furnace, corrosion resistance, electrical conductivity, mechanical strength, aluminum alloy wire

ABSTRACT: The principal shortcoming of aluminum as a conductor material for electrical transmission lines is its low mechanical strength, which necessitates reducing the distance between the line poles. As for the aldrey type aluminum-base conductor alloys, they do have a high mechanical strength, but their electrical conductivity is lower and they involve a complicated manufacturing process. This applies more or less equally to steel-aluminum wire. Therefore, the authors investigated the effect of the addition of

Card 1/3

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8

L 53966-65
ACCESSION NR: AP5013604

small amounts of pure Nb, Be and Ce on the strength characteristics and electrical conductivity of aluminum. These elements were added to molten aluminum in the form of corresponding master alloys with 3.96% Nb, 5.3% Be, and 6.24% Ce. The smelting was performed in graphite-crucible furnaces under a bed of a fluxing agent consisting of 75% $CaCl_2$ and 25% technical cryolite. The obtained cylindrical ingots (diameter 26 mm, height 230 mm) were drawn out into wire of 1.96 mm diameter which was then cut into specimens 1.1 m long. Part of the specimens was investigated in cold-drawn state and the other part, following their 4 hr annealing in a muffle furnace at 375±5°C. Electrical conductivity was measured with a DC potentiometer and a mirror galvanometer at 20°C. Corrosion resistance was determined on the basis of weight losses in a solution of 3% NaCl + 0.1% H_2O_2 over a ten-day period. These tests, as well as an investigation of the constitution diagrams Al-Nb, Al-Be, and Al-Ce, showed that niobium is unsuitable since it insignificantly enhances the strength of aluminum and does not easily fuse with this metal. Beryllium may be a useful additive at up to 0.5%; above that amount, e.g., at 1.1%, it reduces the corrosion resistance of aluminum. Cerium increases the strength while at the same time it hardly increases electrical conductivity of the aluminum

Card 2/3

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8

L 53966-65

ACCESSION NR: AP5013604

alloy and preserver the alloy's plasticity; an alloy containing 0.27% Ce has a relative elongation of 45% in annealed state and 22% in cold-drawn state. Further, cerium increases the corrosion resistance of the aluminum grains. Therefore, cerium in small quantities -- up to 0.3% -- is a useful additive for hardening aluminum and improving its corrosion resistance and electrical conductivity. Orig. art. has: 1 figure, 1 table.

ASSOCIATION: None

SUBMITTED: 000 ENCL: 00 SUB CODE: MM

NR REF SOV: 000 OTHER: 000

Card 3/3 MF

L 04194-67 EWT(m)/EWP(w)/T/EWP(t)/ETI/EWP(k) IJP(c) JD/JG/JH

ACC NR: AP6028589 SOURCE CODE: UR/0129/66/000/008/0060/0062

AUTHOR: Krupotkin, Ya. M.; Gokhshteyn, M. B.

ORG: none

TITLE: Effect of small additions of cerium, iron, nickel and cobalt on the mechanical properties and electroconductivity of aluminum

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 8, 1966, 60-62

TOPIC TAGS: transmission line, electric conductivity, mechanical property, alloying, intermetallic compound, cerium, corrosion resistance

ABSTRACT: The effect of small additions of pure cerium (0.05 to 0.2%), iron (0.25 and 0.5%), nickel (0.3 and 0.6%), and cobalt (0.25 and 0.5%) on the mechanical properties and electroconductivity of aluminum was studied. These elements have low solid solubilities in aluminum and form intermetallic compounds with aluminum. The corrosion resistance of these alloys was determined by weight loss in a 3% NaCl + 0.1% H_2O_2 solution after 10 days. Strength and ductility as a function of cerium content in conjunction with Fe, Ni, and Co additions after cold drawing 97% and after annealing are given. By increasing the cerium content to 0.09% at 0.25-0.5% Fe, the strength rose from 9 to 21 kg/mm^2 for the cold drawn wires and from 5 to 10 kg/mm^2 for annealed wires. No further changes in strength occurred after increasing the cerium content to 0.2%.

UDC: 620.17:669.71

Card 1/2

L 04194-67
ACC NR: AP6028589

The electrical resistance decreased with increase in cerium content. By raising the iron level from 0.24 to 0.52% at 0.09% Ce the specific electrical resistivity increased from 2.76 to 2.82 microhm-cm; analogous changes in strength and electrical resistivity occurred for Ce-Co and Ce-Ni. With the increase in strength a corresponding ductility loss was observed: from 30 to 5% elongation after increasing the cerium content to 0.05% in cold drawn samples and from 60 to 30% in annealed samples. Cerium increased while iron decreased the corrosion resistance of aluminum. In Ce-Co the corrosion resistance was improved, but it was lowered for Ce-Ni additions. Orig. art. has: 1 figure.

SUB CODE: 11,20/ SUBM DATE: none/ ORIG REF: 003

Card 2/2

[illegible], I.I.

[illegible] movements in the [illegible] of the [illegible]. Tr. from: Vest. AN Kazakh. [illegible]

GOKHSHTEYN, V.P., inzh.; SITNITSKIY, I.R., inzh.

New stonecutting units for working high terraces. Stroi.i dor.mashinostr. 5 no.3:7-10 Mr '60. (MIRA 13:6)
(Quarries and quarrying--equipment and supplies)

CIA-RDP86-00513R000515610005-8"

PHASE I BOOK EXPLOITATION SOV/4443

Akademiya nauk SSSR. Komissiya po analiticheskoy khimii

Metody opredeleniya primesey v chistykh metallakh (Methods of Determining Admixtures in Pure Metals) Moscow, 1960. 411 p. (Series: Its: Trudy, 12) 3,500 copies printed.

Resp. Eds. A.P. Vinogradov, Academician, and D.I. Ryabchikov, Doctor of Chemical Sciences; Ed. of Publishing House: M.P. Volynets; Tech. Ed.: T.V. Polyakova.

PURPOSE: This collection of articles is intended for chemists, metallurgists, and engineers.

COVERAGE: The articles describe methods for detecting and determining various admixtures and their traces in pure metals. Also discussed are many chemical, physicochemical, electrochemical, spectrochemical and luminescence methods of analyzing materials of high purity. The editors state that these methods have been developed within the last five or six years by various Soviet scientific institutes, and are now widely used in research and factory laboratories of the Soviet Union. No personalities are mentioned. References, mostly Soviet, accompany each article.

Card 1/9

TABLE OF CONTENTS

Gokhshteyn, Ya. P., M.P. Volynets, and V.D. Yukhtanova. Determination of Admixtures of Copper, Lead, Zinc, Nickel, Iron, and Silver in High-Purity Metallic Germanium by the Oscillographic Polarization Method 5

Karabash, A.G., Sh. I. Peyzulayev, G.G. Morozova, and I.F. Smirenkina. Spectrochemical Method of Determining Admixtures in Metallic Germanium and Germanium Dioxide 25

Babko, A.K., and T.Ye. Get'man. Spectroscopic Detection of Small Quantities of Hydrogen in Metallic Germanium 36

Babko, A.K., and N.S. Kozachuk. Determination of Nitrogen Microadmixtures in Metallic Germanium 48

Babko, A.K. A.I. Volkova, and O.F. Drako. Determination of Small Quantities of Oxygen in Metallic Germanium 53

Melamed, Sh,G., A.K. Rusanov, and M.G. Zemskova. Determination of Tantalum and Niobium in the Pentoxide Mixture 65

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8"

Chistyakova, Ye.M., and Yu.A. Klyachko. Determination of the Percentage of Oxygen in Titanium From the Content of Unconverted α-Phase at Various Quench-Hardening Temperatures 121

Klyachko, Yu.A., and Ye.M. Chistyakova. Determination of Oxygen in Titanium and in Zirconium by the Vacuum-Fusion Method 126

Kononenko, L.I., and N.S. Poluektov. Determination of Small Quantities of Zirconium in Ores 132

Vaynshteyn, E.Ye., A.V. Mikhaylova, M.V. Akhmanova, and Yu. I. Kutsenko. Method of Spectral Determination of Iron, Calcium, Magnesium, Chromium, Nickel, Silicon, and Boron in Zirconium 142

Sotnikova, N.P., L.S. Fomenovich, Sh. T. Peyzulev, and A.G. Karabain. Determination of Admixtures in Zirconium 151

Blokh, M.M., and A.K. Rusanov. Spectrographic Determination of Boron in Zirconium 160

Zakhariya, N.F., and N.A. Puza. Spectral Determination of Admixtures in Hafnium 166

Methods of Determining Admixtures (Cont.) SOV/4443

Melamed, Sh.G., and S.M. Solov'ovnik. Analysis of Bismuth for Determining Admixtures 172

Krauz, L.S., A.D. Karabash, Sh. I.Feyzullayev, V.M. Lipatova, and V.S. Moleva. The Spectrochemical Method of Determining Admixtures in Metallic Bismuth and Its Compounds 175

Sinyakova, S.I., and Ye.F. Gol'traykh. Determination of Small Quantities of Lead in Metallic Bismuth 187

Sinyakova, S.I., and L.A. Tsvetkova. Determination of Admixtures of Cadmium, Silver, and Gold in Metallic Bismuth With the Aid of Dithizone 191

Sinyakova, S.I., and Ch.Ye. Krol'. Determination of Admixtures of Antimony, Iron, Manganese, and Tellurium in Bismuth 206

Ryabchikov, D.I., and V.K. Belyayeva. Determination of Small Quantities of Rare-Earth Elements in Metallic Bismuth 217

Card 5/9

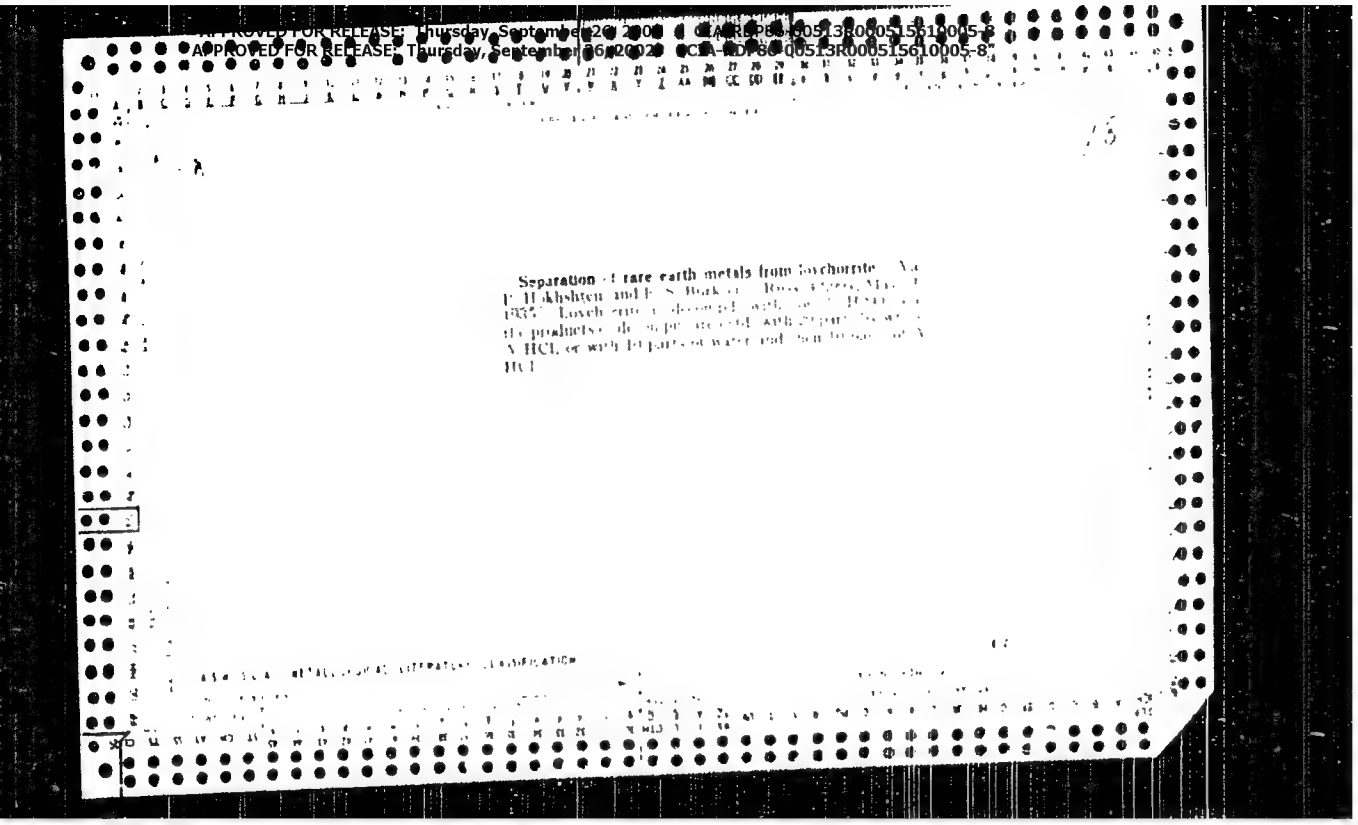
Klyachko, Yu.A., Ye.M. Chistyakova, and I.L. Kunin. Determination of Oxygen and Nitrogen in Molybdenum and in Chromium by the Vacuum-Fusion Method 281

CA

Rare earths and thorium from monazite. G. P. Alexandrov and Yu. P. Gokhshtein. Russ. 30,681, Oct. 31, 1934. Monazite is extd. with H_2SO_4 or is chlorinated and extd. with water. The soln. is treated with $Mg(HSO_3)_2$ and the ppt. worked up in the usual way.

METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP80-00513R000515610005-8



Separation of rare earth metals from loychorrite. Na
F. Ilakhshten and E. S. Bukar'. Ross. Khim. Zhur.
1955. Loych ore is decomposed with
the products de
N HCl, or with 10 parts of water and
HCl

APPROVED FOR RELEASE: Thursday, September 28, 2000 CIA-RDP86-00513R000515610005-8

C/T

PRECIPITATES AND PRECIPITATION

Precipitation of rare earths and thorium with magnesium bisulfite G. P. Aleksandrov and Ya. P. Gokhshtein. *Redkie Metal.* 4, No. 6, 27–31 (1935). Pptn of Th and rare earths with $Mg(HSO_3)_2$ from sulfate and chloride solns led to recoveries of 96–100 and 80–100%, resp.
H. W. Rathmann

C.

Polarographic analysis of commercial barium chloride Ya. P. Gokhshtein. *Zavodskaya Lab.* 5, 28-32(1936). Com. $BaCl_2$ was analyzed with the use of the Heyrovsky and Shikat polarograph with an accuracy of 1%, Fe and 2.5%, $BaCl_2$. To det. insol. matter, dissolve 1 g. $BaCl_2$ in 15 cc. H_2O, filter, wash with a little hot H_2O and det. as usual. To det. Fe, transfer the filtrate, not over 25 cc. vol.) into the electrolytic cell, treat the soln. with H_2S (5 min.) and expell the excess of H_2S with H_2. Test the soln. with KSCN for the absence of any Fe^{+++}, and take the polarogram. On the same polarogram take the curve of a standard soln. of Fe as a comn. of 10^{-4} to 10^{-5} N at the galvanometer sensitiveness of 1:500. Calc. by the formula. To det. the Ba ion, dissolve 0.01 g. $BaCl_2$ in 100 cc. of 0.01 N LiCl, transfer 25 cc. of the soln. into the electrolytic cell, pass H for 60 min., and take the polarogram. Compare this with the polarogram of a standard soln. of $BaCl_2$ of 1×10^{-4} to 10^{-5} N at the galvanometer sensitiveness of 1:250, and calc. as above. An accuracy of 0.5% Ba is obtained by titration of $BaCl_2$ with K_2CrO_4 by the method of Nazarenko. C. A. 30, 7846.

ASM SLA METALLURGICAL LITERATURE CLASSIFICATION

Polarographic analysis of commercial zinc chloride Ya. P. Gokhshtein. *Zavodskaya Lab.* 5, 158-61 (1936). -*C. A.* 30, 4430[9]. To det. Zn in com. $ZnCl_2$ dis- solve 2 g. $ZnCl_2$ in 1 l. H_2O, pass SO_2 through the soln and expel the excess SO_2 with H. Add 11 cc. of 0.1 *N* KCl to 4 cc. of the soln., transfer the mixt. into an electrolyti- cell and take the polarogram. To det. combined H_2SO_4, introduce into the cell 5 cc. of 10 g. $ZnCl_2$ in 1 l. H_2O, add an excess of 0.001 *N* $BaCl_2$, let stand 2 hrs., introduce 2 cc. of 0.1 *N* LiCl and take the polarogram. The difference be- tween the amts. of $BaCl_2$ used and polarographically detd (excess $BaCl_2$) gives the combined H_2SO_4. For joint detn of Al and Fe, treat 2 g. $ZnCl_2$ in H_2O with HNO_3, ppt. with NH_4OH at 80-70°, filter off $Al(OH)_3$ + $Fe(OH)_3$, dissolve the ppt. in dil. HCl, neutralize the soln. with 0.1 *N* NaOH to p_H = 3-4, dil. to 100 cc., pass in SO_2, expel the excess SO_2 with H, withdraw 5 cc. of the soln., add 15 cc. of 0.1 *N* $CaCl_2$ and polarograph. The polarograms of the added electrolytes (KCl, LiCl, $CaCl_2$) should be previously detd.

Chas. Blanc

A&M SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

Polarographic determination of sulfate ion. III. Ya. P. Hakhstein. *Zavodskaya Lab.* 5, 1441-7(1936).—cf. *C. A.* 30, 4280⁸. Accurate results were obtained by detg. sulfate in Et_4NI or Me_4NI electrolyte in the air at the galvanometer sensitiveness from 1:50 to 1:100 with the use of the Heyrovsky and Berezicky polarograph (*C. A.* 23, 2830). Charge an electrolytic cell with 10 cc. of 0.1 *N* Et_4NI, 0.1 *N* LiOH to p_H = 10, add a definite vol. of $BaCl_2$ of known concn. and 1 drop of methyl orange, and proceed with the visual detn. of the approx. amt. of the sulfate soln., corresponding to the Ba^{++} concn. in the electrolyte. Take the polarogram of the soln. similarly prepd., introduce 0.5 cc. less of the sulfate soln. than was used in the visual test and then add the balance dropwise and det. the polarograph after each drop. C. H.

ASB STEEL METALLURGICAL LITERATURE CLASSIFICATION

Determination of lead. J. P. Hocuntzis (Zavod. Lab., 1937, **6**, 269). Polemical against Gaptschenko and Scheintzis (*ibid.*, 1935, **4**, 808, 1014). R. T.

Effect of concentration of an indifferent electrolyte on the size of diffusion current of a given cation. Va P. Holthshtein. *J. Gen. Chem.* (U. S. S. R.) 7, 780-95 (1937). - In a series of expts. made to det. the effect of concn. c' of the indifferent electrolyte, serving as the conducting medium, on the diffusion current i of a given cation, the concn. c of the cation in Fuken's equation $I = \frac{2nRTF_1}{\ldots}$ *Chim. Tchecoslovaque* 6, 453-67 (1934)), $i = \frac{nF}{\ldots}$ (c'), c was kept const. while c' was varied. It was found that by increasing c' in the concn. interval up to 10^{-1} N the diffusion current i first decreases abruptly down to a min., depending on the concn. of the indifferent electrolyte and of the cation being investigated, then, passing into the range of moderate and high concns., i gradually increases. The cations of the following salts were investigated: $ZnCl_2$ in solns. of $LaCl_3$, $BaCl_2 \cdot 2H_2O$ and KI; $NiSO_4 \cdot 7H_2O$ in solns. of $LaCl_3$ and $BaCl_2 \cdot 2H_2O$; $FeSO_4$ in solns. of KCl and LiCl; $MnSO_4$ in solns. of LiCl.

S. L. Madorsky

ASM SLA METALLURGICAL LITERATURE CLASSIFICATION

Effect of concentration of cyanide ion on the magnitude of potential of deposition of nickel on the mercury drop cathode and on the height of diffusion wave of the latter

Polarographic determination of nitrate in the presence of sulfate ion Yu P Hokhshtein *Zavodskaya Lab* (U S S R) 10, 521-7 (in German 527) 1941 — An electrolyzer is filled with the following solns an unknown, a sufficient amt of 0 01 *N* H_2O for the disappearance of red color caused by methyl orange, 1-2 cc of *N* LaCl, and an excess of $BaCl_2$ After connecting the electrolyzer with the polarograph, the reduction of nitrate is observed visually by the usual polarographic procedure The polarogram of the standard KNO_3 soln is also taken The calcn is made by means of the equation $c_x = c_s \cdot h_x / h_s$, where h_x and h_s are the height of wave for the nitrate in the unknown and standard solns, and c_x and c_s the concn of nitrate in the unknown and standard solns, resp In the presence of $LaCl_3$ the reduction of nitrate begins at 1 3 v The $LaCl_3$ concn should be at least 50 times greater than that of the nitrate The analysis is carried without a preliminary removal of O_2 of the air.

V A Podkovyr

Precipitation of rare earths from solutions of lovchorrite
Va. P. Hoklushtein. *Sokhr Metal* 7, No. 1, 16-1 1938.
Ppn. of rare earths from sulfate solns. with $Mg(HSO_3)_2$ yielded recoveries of 88–97%. H. W. Rachmann

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8"

The effect of concentration of cyanide ion on the magnitude of the potential of deposition of nickel on a dropping mercury cathode and on the height of the diffusion curve of the latter. [illegible] Bakhchisaraits[illegible] and [illegible] [illegible] (in English). [illegible] 32, [illegible] In dil. KCN [illegible] the [illegible] potential is neg. with respect to a calom. electrode [illegible] taken as 0. At a KCN conc. [illegible] the potential becomes pos.; at higher [illegible] it then again becomes neg. In the [illegible] of [illegible] contg. Ni salts and KCN the height of the [illegible] remains const. only when the diffusion curve for Ni [illegible] KCN is in excess of the amt. [illegible] the [illegible] to form [illegible] [illegible] no effect [illegible]

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

Adsorption and reduction of oxygen of the air on the dropping-mercury cathode in the presence of CN^- and S^{--}. Ya. P. Hokhshtein. *J. Gen. Chem.* (U. S. S. R.) 9, 2055-9(1939).—The "pos." O max. was changed to "neg." in the presence of small amts. of KCN (about 5×10^{-4} *N*) and at the same time the height of max. increased, but, with an increase of KCN concn., the max. became again "pos." with respect to the zero point. In the presence of small amts. of S^{--} (about 5×10^{-4} *N*) the O max. remained "pos." although approaching the zero point, an increase of the S^{--} concn. caused the max. to become more "pos." The depression of O max. by S^{--} was observed when the concn. of the S^{--} was $^1/_5$ that of CN^-. The diffusion waves for O, obtained in the Na_2S soln. were considerably smaller than those obtained in the presence of KCN. A. A. Podgorny

Physical - Analytical Chem.

The influence of anions on the reduction of nitrate ion at the dropping-mercury cathode Ya. P. Hokhlstcho. *J. Gen. Chem. U. S. S. R.* 10, 1957–62(1940). When 1 ml. 1 *N* $LaCl_3$ is added to 1 ml. 0.01 *N* KNO_3 in an electrolyzing app., the curves show 2 waves, one due to NO_3 reduction (height 31 mm.) appears at −1.04 v. In the presence of 0.1 *N* CN⁻ the height of the second wave increases considerably. When the CN⁻ concn. increases, the height of the first wave continues to increase slowly, at a KNO_3:KCN ratio of 1:1 the height of the second wave is decreased. In the presence of 0.1 *N* CrO_4^{--}, the height of NO_3^- wave increases to 58.2 mm. and then begins to decrease. S. Kaganoff

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515610005-8"

Depression of the maximum on the polarographic curves and the displacement of the reduction potentials of ions on the curve of current strength vs. tension. Ya. P. HOKHSHTEYN. J. Gen. Chem. (U. S. S. R.) 10, 1663-7 (1940).- The depression of the max. formed during the sepn. of Tl from Tl_2SO_4 solns. was investigated. The curves were plotted in the absence of air. The displacements on the polarographic curve of the potentials of the sepn. of cations are caused by surface-active substances. There is a relation between the displacement of the max. of the electrocapillary curve and the displacement of the potential of the sepn. of Tl cations on the polarographic curve. During the displacement of the potential of the sepn. of ions on the current strength-tension curve in the pos. direction the max. of the electrocapillary curve is displaced to the more neg. values of E (as in the presence of CN-), while during the displacement of the max. of the cation in the neg. direction the electrocapillary zero position is displaced in the direction of the more pos. values of E (as in the presence of Tl). The height of the max. on the polarographic curve depends on the distance between the max. position and the electrocapillary zero position. The depression of the pos. max. of Tl under the influence of Al ions and the decrease of the height of the neg. max. of Tl by PO_4---can be explained by the theory of Frumkin about the nature of max. current strength. The max. of Tl are lowered in the presence of multivalent ions PO_4---and Al^{+++} because of the formation of an adsorbed film which has a depressing effect on the motion of the surface of the Hg cathode. This decreases the mixing of the soln. and causes a drop of the max. of the current strength formed by the reduction of Tl^+. Similar phenomena are observed on adding fuchsin to solns. contg. Tl_2SO_4. Six references.

W. R. Henn

Cu

2

Reduction of molybdenum ions at a dropping-mercury cathode. Ya. P. Hokhshtein. *J. Gen. Chem.* (U. S. S. R.) 10, 1729-32(1940).—H. studied the effect of pH on the polarographic wave in the electrolysis of 0.1 *N* $Na_2MoO_4.2H_2O$ solns. in the absence and in the presence of PO_4 ion. Various quantities of 0.1 and 1.0 *N* HNO_3 in the first case, and 0.4407 *N* $HClO_4$ in the 2nd, were added. Beginning at pH 3.27, Mo ions are produced at the Hg cathode. From pH 1.44 the height of the wave increases rapidly. In the presence of PO_4 ion the reduction of ions begins at pH 3 and the wave is smaller than the 1st case. H. suggests that beginning at pH 4.5 the anion $(H_3Mo_8O_{31}.aH_2O)^{---}$ (I) is formed. It is adsorbed on the surface of the Hg drop. With E = 0.45 v., I is produced on the Hg cathode according to: $I + 2e \rightarrow (HMo_8O_{31}.aH_2O)^{----} + H_2$. Beginning at pH 1.8 and at stronger H-ion concns. the Mo ions are transformed into complex pos. ions of lower mol. wt. They have stronger diffusion qualities than I. Below pH = 0.9 only complex pos. ions are produced on the Hg cathode.

R. Richman